



Biology

Time Remaining: 45/45 (Minutes)

Q.1

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Budding off of transfer vesicles is from:

- (a) SER (b) RER
(c) Golgi apparatus (d) Both 'a' & 'b'

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Correct Answer:

☐ A ☐ B ☐ C ☐ D

Next

No internet connection

Time Remaining: 44/45 (Minutes)

Q.2

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

The transport of secretory proteins takes place through organelles in the order

- (a) RER → SER → Golgi → Secretory vesicles
- (b) SER → RER → Golgi → Secretory vesicles
- (c) RER → SER → Secretory vesicles → Golgi
- (d) RER → Golgi → SER → Secretory vesicles

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

Next

Back

No internet connection

Time Remaining: 44/45 (Minutes)

Q.3

Unit 6 Cell Structure &
Functions (B)

BIOLOGY NMDCAT

The function of rough endoplasmic reticulum is to synthesize:

- (a) Lipid
- (b) Carbohydrate
- (c) Protein that will be secreted by the cell
- (d) Cytoplasmic protein necessary for the cell own existence

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 44/45 (Minutes)

Q.4

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Granular endoplasmic reticulum is most abundant in cell types that are involved in:

- (a) Transport of calcium ions
- (b) Producing steroid
- (c) Lipid metabolism
- (d) Protein synthesis

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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No internet connection

Time Remaining: 44/45 (Minutes)**Q.5****Unit 6 Cell Structure & Functions (B)****BIOLOGY NMDCAT****Rough Endoplasmic Reticulum is called 'rough' because:**

- (a) Rough texture of the surface
- (b) Surface is studded with membrane proteins
- (c) Surface is studded with ribosomes
- (d) All of these

STAR INSTITUTE LAHORE[Click Here if Image Doesn't Load](#)**Correct Answer:**☒ A ☐ B ☐ C ☐ D**Next****Back**



Time Remaining: 43/45 (Minutes)

Q.6

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Smooth endoplasmic reticulum:

- (a) Sometimes has ribosomes attached to its membranes
- (b) Is rarely found in skeletal muscle cells
- (c) Is present in cells where drug detoxification is taking place
- (d) All the above

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

Next

Back



Time Remaining: 43/45 (Minutes)

Q.7

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

One of the functions of smooth endoplasmic reticulum is:

- (a) Protein synthesis
- (b) Regulation of intracellular calcium distribution
- (c) Excretion
- (d) Phagocytosis

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 43/45 (Minutes)

Q.8

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Which of the following statements are true regarding endoplasmic reticulum?

- (a) Endoplasmic reticulum provides structural framework to the cell
- (b) Endoplasmic reticulum acts as an intracellular transporting system
- (c) Smooth endoplasmic reticulum is involved in synthesis of lipids
- (d) All of these

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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No internet connection

Time Remaining: 43/45 (Minutes)

Q.9

Unit 6 Cell Structure &
Functions (B)

BIOLOGY NMDCAT

Concerning rough endoplasmic reticulum, it is:

- (a) Composed of membranous tubules and sacs
- (b) The site of protein synthesis that will be secreted by the cell
- (c) Has ribosomes attached with
- (d) All of the above

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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No internet connection

Time Remaining: 43/45 (Minutes)

Q.10

Unit 6 Cell Structure &
Functions (B)

BIOLOGY NMDCAT

A cell with a predominance of smooth endoplasmic reticulum is likely specialized to:

- (a) Store large quantities of water
- (b) Import and export large quantities of protein
- (c) Actively secrete large quantities of protein
- (d) Synthesize large quantities of lipids

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 42/45 (Minutes)

Q.11

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Tay-Sachs disease is a human genetic abnormality that results in cells accumulating and becoming clogged with very large, complex, undigested lipids. Which cellular organelle is most likely defective in this condition?

- (a) The lysosome
- (b) The Golgi apparatus
- (c) The smooth endoplasmic reticulum
- (d) The rough endoplasmic reticulum

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 44/45 (Minutes)

Q.12

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

The liver is involved in detoxification of many poisons and drugs. Which of the following structures is primarily involved in this process and, therefore, abundant in liver cells?

- (a) Rough endoplasmic reticulum
- (b) Smooth endoplasmic reticulum
- (c) Golgi apparatus
- (d) Nuclear envelope

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 44/45 (Minutes)

Q.13

Unit 6 Cell Structure &
Functions (B)

BIOLOGY NMDCAT

Mitochondrial component connected with ATP synthesis:

- (a) Inner membrane (b) Outer membrane
(c) Matrix (d) F_1 particles

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

Next

Back



Time Remaining: 44/45 (Minutes)

Q.14

Unit 6 Cell Structure &
Functions (B)

BIOLOGY NMDCAT

Inner membrane involutions of mitochondria are called:

- (a) Lamellae (b) Cristae
(c) Thylakoid (d) Tubules

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 44/45 (Minutes)

Q.15

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Mitochondrial cristae are sites of:

- (a) Kreb's cycle
- (b) Oxidation reduction reaction
- (c) Protein synthesis
- (d) Lipid synthesis

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Correct Answer:



A



B



C



D

Next

Back



Time Remaining: 43/45 (Minutes)

Q.16

Unit 6 Cell Structure &
Functions (B)

BIOLOGY NMDCAT

Mitochondria are self-replicating organelles as they have

- (a) Thylakoids (b) Oxysomes
(c) Ribosomes (d) DNA

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 43/45 (Minutes)

Q.17

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Which of the following statements regarding mitochondrial membrane is not correct?

- (a) The outer membrane is permeable to all kinds of molecules
- (b) The enzymes of electron transport chain are embedded in the outer membrane
- (c) The inner membrane is highly convoluted forming a series of infoldings
- (d) The outer membrane resembles a sieve

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 43/45 (Minutes)

Q.18

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

The type of spent energy in Mitochondria is:

- (a) ADP (b) GTP
(c) ATP (d) CTP

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 43/45 (Minutes)

Q.19

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

The metabolic process that does not take place in mitochondria is:

- (a) Aerobic respiration
- (b) Anaerobic respiration
- (c) Krebs's cycle
- (d) Pyruvic acid oxidation

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 43/45 (Minutes)

Q.20

Unit 6 Cell Structure &
Functions (B)

BIOLOGY NMDCAT

In mitochondria, F_1 particles are present on the:

- (a) Outer side of outer membrane
- (b) Inner side of the outer membrane
- (c) Inner side of inner membrane
- (d) Outer side of the inner membrane

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 43/45 (Minutes)

Q.21

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

The inner membrane of mitochondria bears stalked particles on the inner surface, which are called:

- (a) Oxysomes (b) Elementary particles
(c) F_0-F_1 particles (d) All of these

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 42/45 (Minutes)

Q.22

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Which of the following pair is incorrect?

- (a) Ribosome: Protein synthesis
- (b) Chloroplast: Photosynthesis
- (c) Mitochondria: Fermentation
- (d) Plasma membrane: Osmosis

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 42/45 (Minutes)

Q.23

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

An example of binucleated cell is:

- (a) Paramecium
- (b) Myocyte
- (c) WBC
- (d) Mature mammalian RBC

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 42/45 (Minutes)

Q.24

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

The nucleolus is formed of:

- (a) Protein & DNA (b) Protein & RNA
(c) Chromatin (d) Protein only

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 42/45 (Minutes)

Q.25

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

The nucleolus is formed of:

- (a) Heterochromatin & euchromatin
- (b) Granular & fibrillar parts
- (c) Nucleolus associated & peripheral chromatin
- (d) Condensed chromatin

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 41/45 (Minutes)

Q.26

Unit 6 Cell Structure &
Functions (B)

BIOLOGY NMDCAT

Nucleus has:

- (a) DNA only
- (b) DNA & protein only
- (c) DNA, RNA and proteins
- (d) None of these

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 41/45 (Minutes)

Q.27

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Nucleolus is a prominent acidophilic spherical bodies in the nucleus. The function is:

- (a) RNA synthesis
- (b) DNA synthesis
- (c) Histone synthesis
- (d) Ribosomal subunit synthesis

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Back



Time Remaining: 41/45 (Minutes)

Q.28

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Which of the following cell lacks nucleus?

- (a) Cardiac cells (b) Mature mammalian RBCs
(c) WBCs (d) Bone cells

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 41/45 (Minutes)

Q.29

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Which of the following organelles always contains DNA?

- (a) Centriole (b) Golgi apparatus
(c) Lysosome (d) Mitochondrion

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 41/45 (Minutes)

Q.30

Unit 6 Cell Structure &
Functions (B)

BIOLOGY NMDCAT

Which of the following correctly describes the function of nucleoli?

- (a) The formation of new DNA molecule
- (b) The organization of the spindle fibres during nuclear division
- (c) The replication of mitochondria following nuclear division
- (d) The formation of ribosomes

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 40/45 (Minutes)

Q.31

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Which of the following cell structures contains the highest amount of RNA?

- (a) Centriole (b) Chromosome
(c) Lysosome (d) Nucleolus

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

Next

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Time Remaining: 40/45 (Minutes)

Q.32

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

A tadpole's tail is gradually broken down during metamorphosis into an adult frog. Which organelle increases in number in cells of the tail at this time?

- (a) Centriole (b) Endoplasmic reticulum
(c) Golgi apparatus (d) Lysosome

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 40/45 (Minutes)

Q.33

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

In eukaryotic cells, transcription occurs in the nucleus. In which other organelle does transcription occur?

- (a) Golgi apparatus (b) Endoplasmic reticulum
(c) Mitochondrion (d) Ribosome

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 40/45 (Minutes)

Q.34

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

A certain cell organelle which is made of a double phospholipid bilayer that has many large pores in it, is most likely the:

- (a) Nucleus (b) Plasma membrane
(c) Mitochondrion (d) Cytoskeleton

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 39/45 (Minutes)

Q.35

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Passage through pores in the nuclear envelope is restricted primarily to:

- (a) Proteins, RNA, and protein-RNA complexes
- (b) Lipids and glycolipids
- (c) DNA and RNA
- (d) RNA and protein-carbohydrate complexes

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 39/45 (Minutes)

Q.36

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

In a normal human being, number of sex chromosomes is:

- (a) 46
(c) 44

- (b) 23
(d) 2

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 39/45 (Minutes)

Q.37

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Which of the following is the collection of sacks containing chlorophyll?

- (a) Outer Membrane (b) Inner Membrane
(c) Stroma (d) Thylakoids

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Time Remaining: 39/45 (Minutes)

Q.38

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Which of the following is the liquid inside the chloroplast?

- (a) Outer Membrane (b) Inner Membrane
(c) Stroma (d) Thylakoids

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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Biology

Time Remaining: 38/45 (Minutes)

Q.39

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

What is the primary purpose of cristae in the mitochondria?

- (a) Prevent the mitochondria from folding in on itself
- (b) No purpose has yet been identified; they are likely an evolutionary remnant
- (c) Provide a large surface area for chemical reactions
- (d) Protect the mitochondrial genome

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

Next

Back

Biology

Time Remaining: 38/45 (Minutes)

Q.40

Unit 6 Cell Structure & Functions (B)

BIOLOGY NMDCAT

Where does the Krebs cycle take place in the mitochondria?

- (a) Mitochondrial matrix
- (b) Inner mitochondrial membrane
- (c) Outer mitochondrial membrane
- (d) Intermembrane space

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Correct Answer:

☒ A ☐ B ☐ C ☐ D

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01

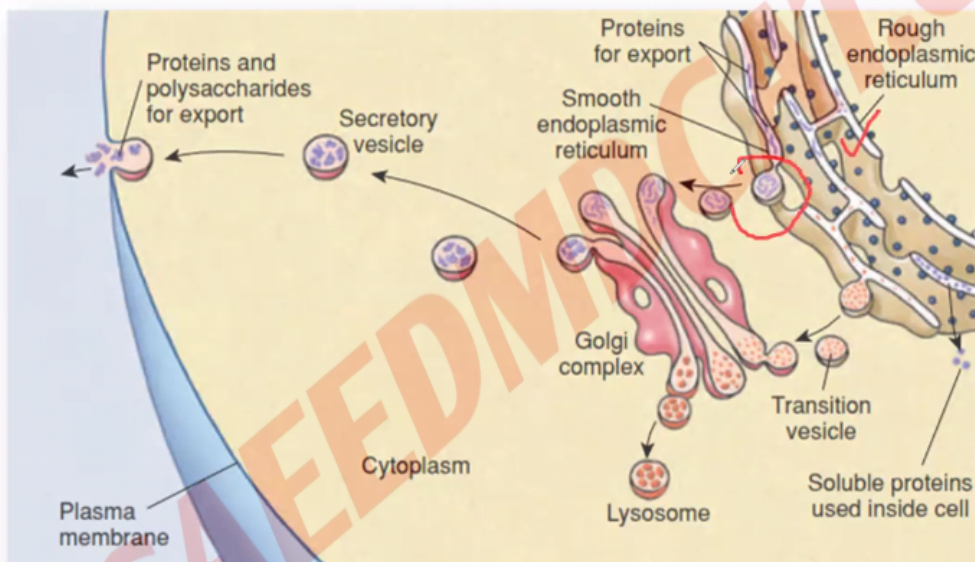
Budding off of transfer vesicles is from:

- (a) SER
- (b) RER
- (c) Golgi apparatus
- (d) Both 'a' & 'b'

02

The transport of secretory proteins takes place through organelles in the order:

- (a) RER → SER → Golgi → Secretory vesicles
- (b) SER → RER → Golgi → Secretory vesicles
- (c) RER → SER → Secretory vesicles → Golgi
- (d) RER → Golgi → SER → Secretory vesicles



03

The function of rough endoplasmic reticulum is to synthesize:

- (a) Lipid
- (b) Carbohydrate
- (c) Protein that will be secreted by the cell**
- (d) Cytoplasmic protein necessary for the cell own existence

04

Granular endoplasmic reticulum is most abundant in cell types that are involved in:

- (a) Transport of calcium ions
- (b) Producing steroid hormones
- (c) Lipid metabolism
- (d) Protein synthesis

05

Rough Endoplasmic Reticulum is called 'rough' because:

- (a) Rough texture of the surface
- (b) Surface is studded with membrane proteins
- (c) Surface is studded with ribosomes**
- (d) All of these

06

Smooth endoplasmic reticulum:

- (a) Sometimes has ribosomes attached to its membranes
- (b) Is rarely found in skeletal muscle cells
- (c) Is present in cells where drug detoxification is taking place**
- (d) All the above

07

One of the functions of smooth endoplasmic reticulum is:

- (a) Protein synthesis
- (b) Regulation of intracellular calcium distribution**
- (c) Excretion
- (d) Phagocytosis

08

Which of the following statements are true regarding endoplasmic reticulum?

- (a) Endoplasmic reticulum provides structural framework to the cell
- (b) Endoplasmic reticulum acts as an intracellular transporting system
- (c) Smooth endoplasmic reticulum is involved in synthesis of lipids
- (d) All of these**

09

Concerning rough endoplasmic reticulum, it is:

- (a) Composed of membranous tubules and sacs
- (b) The site of protein synthesis that will be secreted by the cell
- (c) Has ribosomes attached with
- (d) All of the above**

10

A cell with a predominance of smooth endoplasmic reticulum is likely specialized to:

- (a) Store large quantities of water
- (b) Import and export large quantities of protein
- (c) Actively secrete large quantities of protein
- (d) Synthesize large quantities of lipids**

11

Tay-Sachs disease is a human genetic abnormality that results in cells accumulating and becoming clogged with very large, complex, undigested lipids. Which cellular organelle is most likely defective in this condition?

- (a) The lysosome
- (b) The Golgi apparatus
- (c) The smooth endoplasmic reticulum
- (d) The rough endoplasmic reticulum

12

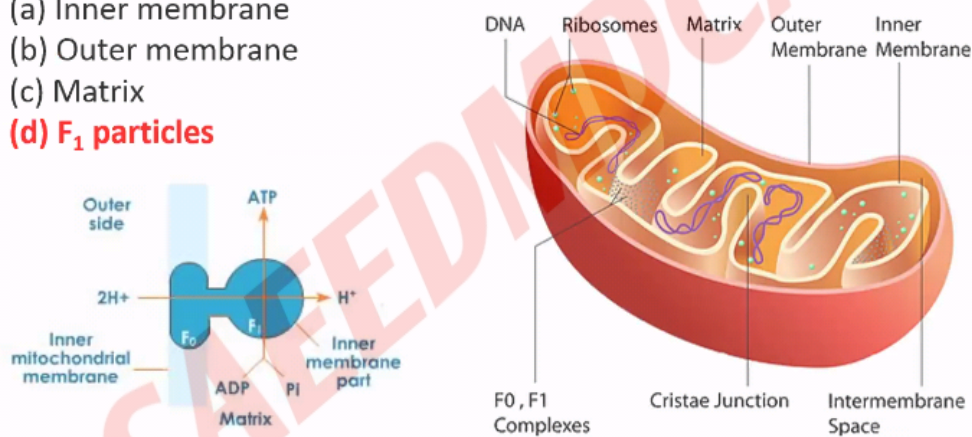
The liver is involved in detoxification of many poisons and drugs. Which of the following structures is primarily involved in this process and, therefore, abundant in liver cells?

- (a) Rough endoplasmic reticulum
- (b) Smooth endoplasmic reticulum**
- (c) Golgi apparatus
- (d) Nuclear envelope

13

Mitochondrial component connected with ATP synthesis:

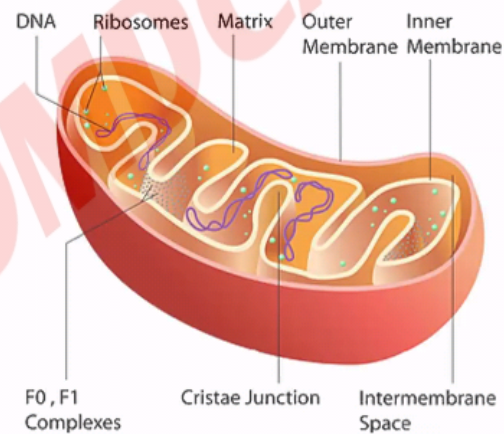
- (a) Inner membrane
- (b) Outer membrane
- (c) Matrix
- (d) F_1 particles



14

Inner membrane involutions of mitochondria are called:

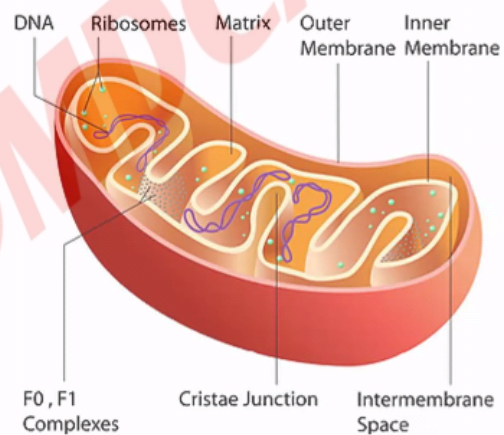
- (a) Lamellae
- (b) Cristae**
- (c) Thylakoid
- (d) Tubules



15

Mitochondrial cristae are sites of:

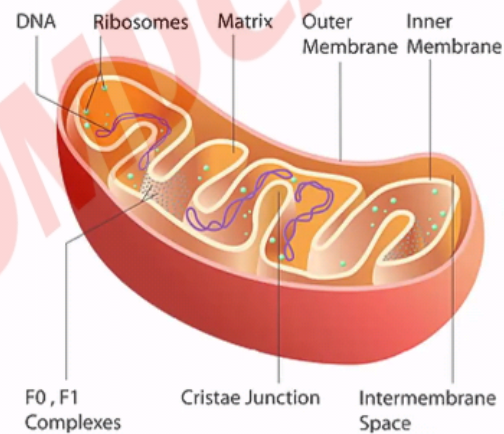
- (a) Kreb's cycle
- (b) Oxidation reduction reaction**
- (c) Protein synthesis
- (d) Lipid synthesis



16

Mitochondria are self-replicating organelles as they have:

- (a) Thylakoids
- (b) Oxysomes
- (c) Ribosomes
- (d) DNA**



17

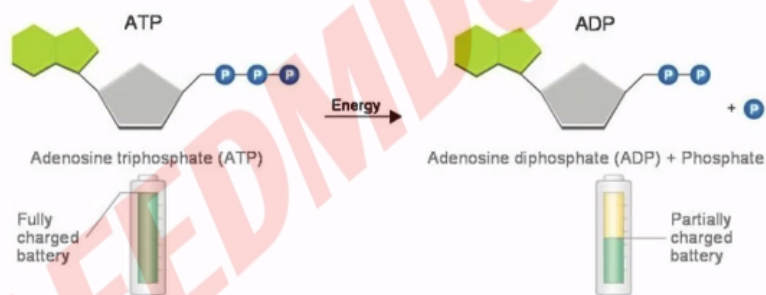
Which of the following statements regarding mitochondrial membrane is not correct?

- (a) The outer membrane is permeable to all kinds of molecules
- (b) The enzymes of electron transport chain are embedded in the outer membrane**
- (c) The inner membrane is highly convoluted forming a series of infoldings
- (d) The outer membrane resembles a sieve

18

The type of spent energy in Mitochondria is:

- (a) ADP
- (b) GTP
- (c) ATP
- (d) CTP



19

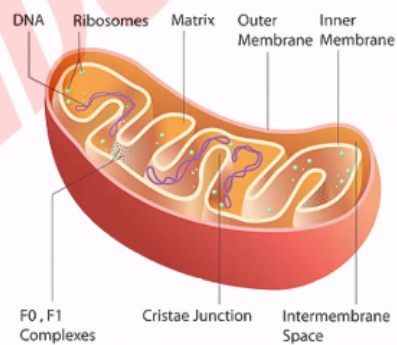
The metabolic process that does not take place in mitochondria is:

- (a) Aerobic respiration
- (b) Anaerobic respiration**
- (c) Krebs's cycle
- (d) Pyruvic acid oxidation

20

In mitochondria, F_1 particles are present on the:

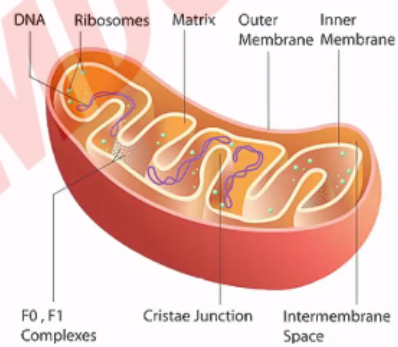
- (a) Outer side of outer membrane
- (b) Inner side of the outer membrane
- (c) Inner side of inner membrane**
- (d) Outer side of the inner membrane



21

The inner membrane of mitochondria bears stalked particles on the inner surface, which are called:

- (a) Oxysomes
- (b) Elementary particles
- (c) F_0-F_1 particles
- (d) All of these



22

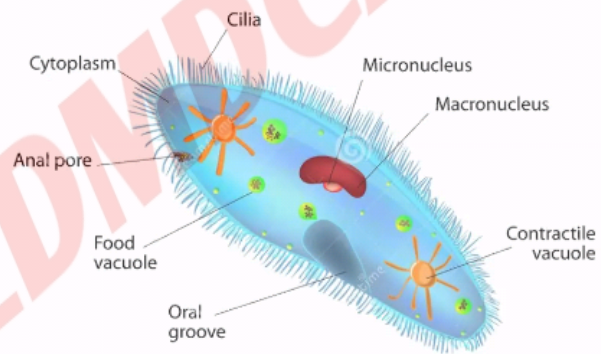
Which of the following pair is incorrect?

- (a) Ribosome: Protein synthesis
- (b) Chloroplast: Photosynthesis
- (c) Mitochondria: Fermentation**
- (d) Plasma membrane: Osmosis

23

An example of binucleated cell is:

- (a) **Paramecium**
- (b) Myocyte
- (c) WBC
- (d) Mature mammalian RBC



24

The nucleolus is formed of:

- (a) Protein & DNA
- (b) Protein & RNA**
- (c) Chromatin
- (d) Protein only

25

The nucleolus is formed of:

- (a) Heterochromatin & euchromatin
- (b) Granular & fibrillar parts**
- (c) Nucleolus associated & peripheral chromatin
- (d) Condensed chromatin

26

Nucleus has:

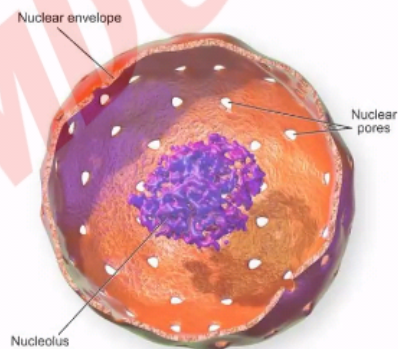
- (a) DNA only
- (b) DNA & protein only
- (c) DNA, RNA and proteins**
- (d) None of these

27

Nucleolus is a prominent acidophilic spherical bodies in the nucleus.

The function is:

- (a) RNA synthesis
- (b) DNA synthesis
- (c) Histone synthesis
- (d) Ribosomal subunit synthesis**



Which of the following cell lacks nucleus?

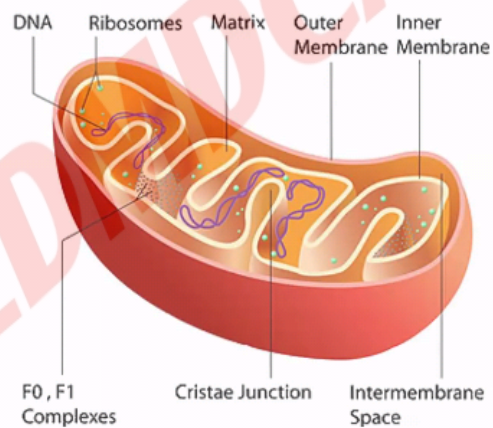
28

- (a) Cardiac cells
- (b) Mature mammalian RBCs**
- (c) WBCs
- (d) Bone cells

29

Which of the following organelles always contains DNA?

- (a) Centriole
- (b) Golgi apparatus
- (c) Lysosome
- (d) Mitochondrion**



30

Which of the following correctly describes the function of nucleoli?

- (a) The formation of new DNA molecule
- (b) The organization of the spindle fibres during nuclear division
- (c) The replication of mitochondria following nuclear division
- (d) The formation of ribosomes**

31

Which of the following cell structures contains the highest amount of RNA?

- (a) Centriole
- (b) Chromosome
- (c) Lysosome
- (d) Nucleolus



32

A tadpole's tail is gradually broken down during metamorphosis into an adult frog. Which organelle increases in number in cells of the tail at this time?

- (a) Centriole
- (b) Endoplasmic reticulum
- (c) Golgi apparatus
- (d) Lysosome

33

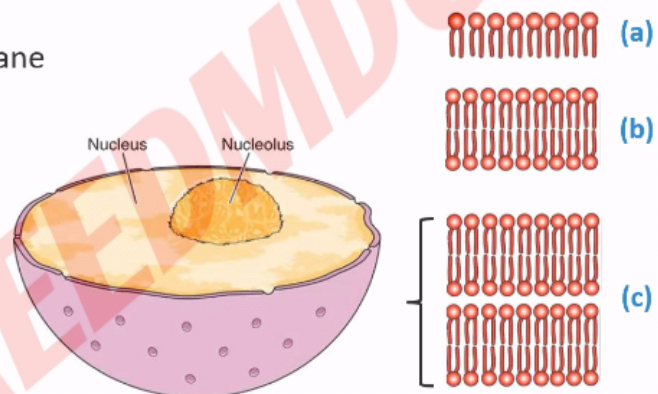
In eukaryotic cells, transcription occurs in the nucleus. In which other organelle does transcription occur?

- (a) Golgi apparatus
- (b) Endoplasmic reticulum
- (c) Mitochondrion**
- (d) Ribosome

34

A certain cell organelle which is made of a double phospholipid bilayer that has many large pores in it, is most likely the:

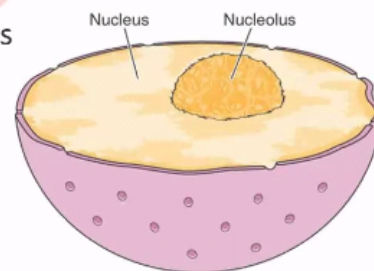
- (a) Nucleus
- (b) Plasma membrane
- (c) Mitochondrion
- (d) Cytoskeleton



35

Passage through pores in the nuclear envelope is restricted primarily to:

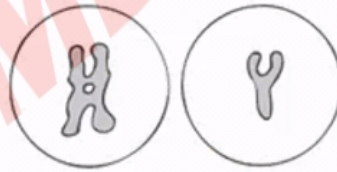
- (a) **Proteins, RNA, and protein-RNA complexes**
- (b) Lipids and glycolipids
- (c) DNA and RNA
- (d) RNA and protein-carbohydrate complexes



36

In a normal human being, number of sex chromosomes is:

- (a) 46
- (b) 23
- (c) 44
- (d) 2



37

Which of the following is the collection of sacks containing chlorophyll?

- (a) Outer Membrane
- (b) Inner Membrane
- (c) Stroma
- (d) Thylakoids**

38

Which of the following is the liquid inside the chloroplast?

- (a) Outer Membrane
- (b) Inner Membrane
- (c) Stroma**
- (d) Thylakoids

39

What is the primary purpose of cristae in the mitochondria?

- (a) Prevent the mitochondria from folding in on itself
- (b) No purpose has yet been identified; they are likely an evolutionary remnant
- (c) Provide a large surface area for chemical reactions**
- (d) Protect the mitochondrial genome

40

Where does the Krebs cycle take place in the mitochondria?

(a) Mitochondrial matrix

(b) Inner mitochondrial membrane

(c) Outer mitochondrial membrane

(d) Intermembrane space